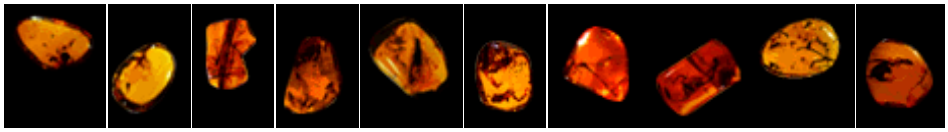
About Amber



Origins of Amber

For more than 11,000 years, people have collected, traded, carved, and examined amber; yet much about the substance remains a mystery. For example, no one is certain how amber manages to preserve the organisms entrapped in it (called "inclusions") so exquisitely. It is thought that terpenes, compounds that become linked as the resin hardens, help to preserve the inclusions by dehydrating the organisms and killing any bacteria that might cause decay. Moreover, the organisms' tissues do not shrink as they normally would during the dehydration process; as a result their cellular structure remains intact, making amber inclusions perfect for DNA study.

Amber from the Age of Dinosaurs

Amber from the Cretaceous period, 65 to 140 million years ago, when the later dinosaurs flourished, offers some of the earliest glimpses of many life forms. During this period, flowering plants (now the dominant life form on earth) evolved along with bees, moths, and other symbiotic insects. Cretaceous amber, from extinct conifer trees, is brittle and fractures easily.

Specimens of amber from the Cretaceous period can be found all over the world, with the largest deposit in Northern Russia. The Middle East has the oldest Cretaceous amber containing insects and other larger organisms. In Kuji, Japan, there are pieces of amber that are 85 million years old. The United States has several Cretaceous deposits, although only in New Jersey is amber found in appreciable quantities. Deposits there range in age from approximately 65 to 95 million years old.

Stingless bee *Trigona prisca*

Length of amber : .75 inches. American Museum of Natural History (Entomology).

This drawing depicts one of the most important insect fossils, the oldest known bee, *Trigonaprisca*, which is encapsulated in amber from New Jersey. Although it dates from 65 to 80 million years ago, this specimen belongs to a surprisingly recent evolutionary group, raising questions about the corresponding evolution of flowering plants.

Mushroom
Archaeomarasmius leggetti

Length of amber : .5 inches. American Museum of Natural History (Entomology).

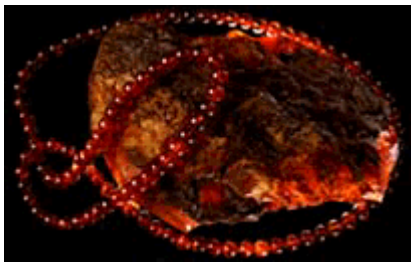
The oldest known mushroom, *Archaeomarasmiusleggetti*, found in 90- to 94-million-year-old amber from New Jersey.

Baltic Amber

The world's largest amber deposits come from the shores of the Baltic Sea, where amber has been harvested, traded, and crafted into decorative objects for at least 13,000 years. The 400-square-mile Samland Peninsula alone has produced ninety percent of all the amber in Europe. Until the mid-nineteenth century, pieces of Baltic amber were collected primarily from beaches. Since the 1850s, when engineers began dredging and mining operations, millions of pounds of Baltic amber have been mined.

Large Piece of Baltic Amber

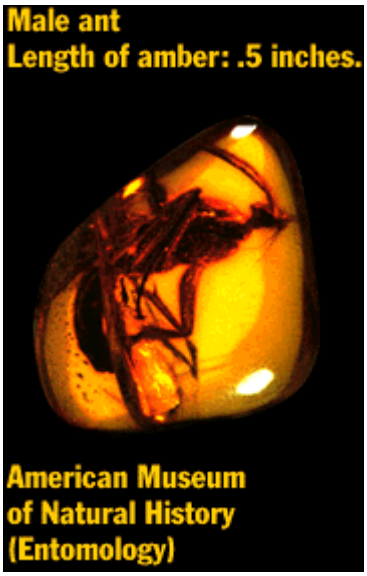
A large piece of Baltic amber, left unpolished to show the natural fissures, with a necklace of polished amber beads.



Length of amber : 9.8 inches. American Museum of Natural History (Earth and Planetary Sciences).

Dominican Amber

Twenty-three- to thirty-million-year-old amber from the Dominican Republic is prized for the diversity of inclusions it contains. Dominican amber is mined chiefly to the north and east of Santiago, where landslides reveal veins of lignite -- or blackened, fossilized wood -- which accompany amber deposits. Using shovels and machetes, the amber miners may burrow deep into mountains, sometimes forming tunnels 100 to 200 feet long. Slightly softer than Baltic amber, amber from the Dominican Republic was produced by a *Hymenaea* tree, a now-extinct tree of the legume family. Dominican amber occurs in several colors, including yellow and deep red, as well as the rarer blue and smoky green.



The ant is a deep red because the body cavity is pyritized, a process that occurs when inclusions trapped close to the surface are exposed to minerals in the surrounding matrix.

Tertiary Amber

Among the dozens of major amber deposits scattered throughout the world, most are from the Tertiary period, which dates from 1.6 to 65 million years ago. The deposits vary in age, botanical origin, color, and composition, and occur on every continent except Antarctica. The largest piece of transparent amber in the world, which weighs 33.5 pounds, comes from northern Myanmar, and is 40 to 50 million years old. Sicilian amber -- deposits of which are much smaller -- is approximately 20 million years old. The largest North American deposit of Tertiary amber is in Arkansas.

what clues it provides about this ancient ecosystem.

Amber in Nature

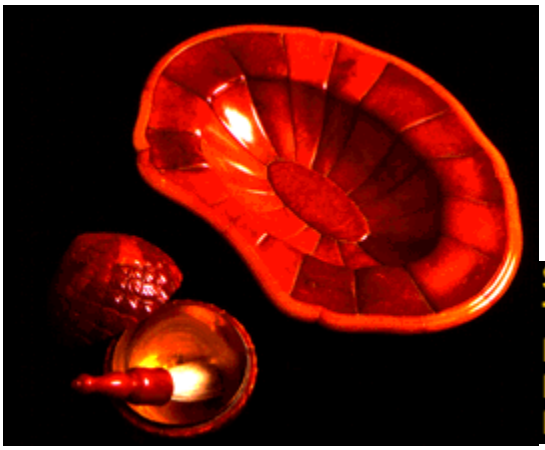
Amber is a form of tree resin -- exuded as a protective mechanism against disease and insect infestation -- that has hardened and been preserved in the earth's crust for millions of years. Often regarded as a gem, amber is actually an organic substance whose structure has changed

very little over time, unlike that of other fossilized material, in which organic matter is replaced with minerals.

Because amber oxidizes and degrades when exposed to oxygen, it is preserved only under special conditions. Thus it is almost always found in dense, wet sediments, such as clay and sand that formed at the bottom of an ancient lagoon or a river delta. While hundreds of amber deposits occur around the world, most of them contain only trace amounts of the substance; only about twenty deposits in the world contain amounts of amber large enough to be mined.

Amber has preserved ancient life to such infinitesimal detail that it even captures fragments of DNA of the organisms entrapped in it. Such a wide variety of creatures has been found in Dominican amber, for example, that scientists are able to reconstruct this ancient ecosystem with amazing intricacy.

Amber in Art



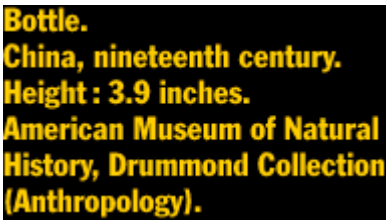
Shaving Basin with Soap Dish and Brush.
Tsarskoye Selo Amber Workshop, 1767.
Length of Basin : 11.4 inches.
Height of Dish : 3.9 inches.
Length of Brush Handle : 4.3 inches.

These objects were part of the so-called Knight's Set, which originally included a case for ointments, a snuff box, two studs, a flask, a jar, a toothbrush, and a clothes brush, all of which were made from amber. These objects are from the collection of the Ekatarininsky Palace, Saint Petersburg.

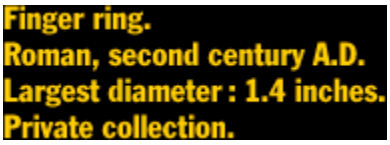
For thousands of years people have carved beads, charms, and religious objects from amber, often believing that it held special symbolic powers. The Etruscans frequently used the substance when depicting gods and goddesses; the Greeks referred to amber as "elektron" (the root of the modern word "electricity"), or "substance of the sun;" and Roman legions were dispatched to the Baltic in search of this organic material.

The oldest amber artifacts ever excavated are roughly hewn beads that date back to 11,000 - 9,000 B.C., making amber the original precious substance. However, despite the cultural significance of amber, large-scale production of objects carved from amber did not occur until 3,400 - 3,100 B.C. Amber trade burgeoned around 3,100 - 2,500 B.C., especially in the eastern Baltic region, where large deposits of transparent amber, highly prized for carving, were found. By the fourteenth century A.D., amber guilds were established along the Baltic coast. Artisans from these guilds used the material's delicacy, transparency, and striking variations in color to create decorative objects for use in religious ceremonies and in court.

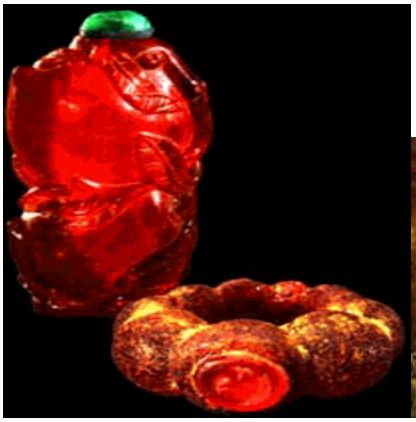
During the sixteenth and seventeenth centuries, craftsmen perfected the traditional methods of sculpting and relief carving in amber and established two new techniques, encrustation -- the piecing together of intricate amber mosaics that were subsequently glued to a piece of wood -- and *verreéglomisée*, in which ornamental designs, landscapes, and phrases were engraved onto the back of a transparent piece of amber and often highlighted with a piece of ivory or gold foil. Using these newly acquired techniques, master artisans created decorative objects that often surpassed those of previous centuries in both intricacy and size.



Made of deep red, transparent amber with a jade stopper, this bottle features two large peaches on a branch, which stretches along one side. The inner cavity has a very irregular wall and is remarkable in that the only opening for carving it is a hole, one-eighth of an inch in diameter, which is located at the top.



The surface of this ring, which was carved from a single piece of clear red amber, is extensively crazed. A small oval plaque of carnelian inscribed with the profile of an eagle (a popular intaglio device from this period) is situated on the widest part of the ring. Amber rings were popular between the reigns of Nero and Septimius Severus (2nd century A.D.).



History of the Amber Room

Offered in 1716 as a gift from Prussian King Frederick William I to Czar Peter the Great, the walls of this chamber -- consisting of twenty-two panels -- were completely covered in a mosaic of more than 100,000 meticulously carved pieces of amber. Among the elaborate carvings were intricate coats-of-arms, monograms, and inlaid decorations depicting landscapes and mythological scenes. In 1755 the chamber was installed in the Ekatarininsky Palace, outside St. Petersburg, where it remained for nearly two centuries. The panels were dismantled and hidden by the Nazis in 1942; they have never been recovered.

Re-creation of the Amber Room

Since 1979, Russian craftsmen have been creating a replica of the Amber Room, relying on large black-and-white archival photographs that were taken prior to the Nazi invasion. Each piece of amber is carefully cut to the same shape and thickness of the original, and is then polished and fit into the mosaic. Newly created panels from the corner of the replicated amber room are on view in *AMBER: Window to the Past*.